Database Evolution at MDOT

Past, Present, and Future
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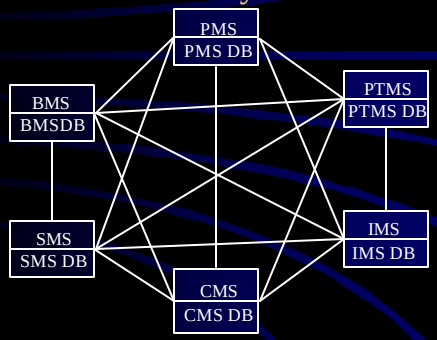
Where Were We in 1985-91?

- Mainframe -- terminals, UniSys
- Each “system” had it’s own data files / base
  - No sharing
- Systems had “evolved” since the 60’s
  - Tactical, addressed work area needs
- Lots of Project Management (SDM -70)
- No Development methodology
  - “creative” programming. Few enforced standards

Tactical Systems



What was the Impact?

- Every system had to have links to every other system
- Main focus was writing data translation and reformatting programs, instead of new apps
- Many, many chances for error
- Interrelationships too complex to succeed

What was Happening 1985-91?

- PCs becoming more available to users
- PC software much more capable than mainframe
- Users developing software on their desks
  - duplicating mainframe software on desktops
  - Gunslingers -- get the job done
- Users becoming more sophisticated -- pushing IT community.

Control Section Reconciliation

- Periodic efforts to standardize
- Everyone used it, but used it differently
  - Middle digit = 8 meant it was to be turned back
  - Adding 80 or 90 to mile point meant reverse direction. Negative meant something else.
  - Finance used it for funding codes, not roadways
  - Planning (sometimes) used digit 3 to indicate the position in the county
- No way to account for road system changes
- No ramps, cross-overs, or non-trunklines

Business Implications

- Many versions of data. Which was correct?
  - Low or unknown data quality
- Shopping for information
- Lots of duplication
- Technical
  - (Over time) Patchwork of fixes to make things go
  - Maintenance Overload
  - Extremely long development times
- Recognition that something needed to be done

Catalysts

- Data Architecture Study
- Mainframe replacement decision
- ISTEA Legislation of 1991

Data Architecture Study

- Looked at MDOT's:
  - Data flows and dependencies
  - Business Processes
  - Structure of MDOT's software
  - Hardware environment
- Definition and diagram of MDOT's major process areas.
- Identification of Strategic, and Tactical systems

Mainframe Replacement (Rehosting)

- MDOT's Unisys A-15 mainframe dying
- Client-Server was new, and expanding
  - promised avenue to fixing some of our long-standing data and application issues
- Should we migrate software that didn't meet needs? Or look at our processes and move to the CS environment?
- 17,000-20K files/programs on mainframe
  - Who owned? Who ran? Who cared?
- Decided to embrace CS technology

MDOT's IT Choices

- Mainframe
  - Maintain Old Processes
  - Maintain old programs
  - Accept long change cycles
  - Accept high, monolithic costs from single vendor
- Client-Server
  - Re-design Processes
  - Produce up-to-date programs
  - Shoot for faster development cycles
  - More flexible environment with competition

ISTEA 1991 Requirements[1] (Planning)

- New Planning Requirements
  - State Transportation Improvement Program (STIP) reporting
  - All of Federal Aid system
  - Coordination / cooperation w/local agencies
  - Financial constraints
- ESDC told us they couldn't modify existing software/data to meet requirements in time

ISTEA Requirements[2] Management Systems

- 6 Systems
  - Bridge
  - Congestion
  - Intermodal
  - Pavement
  - Public Transportation
  - Safety

What did MDOT Do?

- Mainframe
- ISTEA (Planning)
- ISTEA (Mgt Systems)
- Embraced Client/Server
  - Migrated data
- Develop Software
  - PINS Development
  - FOS Development
- MAP Phase I
- Adopt PR /MALI
- Design Data
- Developed Mgt Systems

What Else?

- Business Process Identification & Analysis
  - Business Process 4 (as numbered from DA study
    - Covered Project Development Process
    - Led to many of the 'tactical' systems
    - Guided & directed
- Pursued CPRKS (to be come Field Manager)
- Adopted TRNS*Port

What about Today?

- 5-6 Major Applications/Systems (Strategic)
  - MPINS, MFOS
  - Management Systems (from ISTEA)
  - TRNS*Port & Field Manager
  - P/PMS
- Many ‘tactical’ systems
  - support work area needs to support the project development process
  - Used to be known as ‘PROSE’ systems
- Non-Business Process 4 activities
  - Finance, Human Resources, other support

What has Enabled These?

- Technology (of course)
- Federal and other mandates
- Standards
  - technical - standard hw and sw
  - business - definition of processes and data
- Management / Executive Commitment

What Problems are There?

- External customers have different situations
  - PC operating systems to support
    - Win 95, Win 98, Win 98SE, Windows ME
    - Windows XP Home
    - Window NT, Windows 2000, Windows XP Prof.
- Difficulty in updating software
  - Client server systems are sizeable to distribute
- Security concerns with accessing databases

What is the Next Big Thing?

- Enabling applications for location
  - largest barrier for sharing location data
  - long standing problem
- Use of GPS for data collection
  - Let GIS and GPS handle many location problems
- Moving Client Server to the web
  - when appropriate (BOWS, PTMS-Web)

Other 'Big Things'

- Managing our data environment
  - We've made progress
  - Can we maintain it? Over time?
  - Do we have the processes?
- Keeping our environment open
  - Can our customers get to our /their data?
- Can we remain flexible? In our new environment?

MDOT TMS Integration Scheme